WHAT IS CLAIMED IS:

1. A localized system for dissipating heat generated by an electronic component, said system comprising:

a controllable cooling element; and

a control system for controlling said cooling element;

wherein said control system adjusts a speed of operation of said cooling element in response to variations in power consumption of said electronic component.

2. The system of claim 1, wherein said control system further adjusts said speed of said cooling element in response to variations in temperature of said electronic component.

3. The system of claim 1, wherein said control system increases said speed of said cooling element when said power consumption of said electronic component increases.

4. The system of claim 1, wherein said control system decreases said speed of said cooling element when said power consumption of said electronic component decreases.

5. The system of claim 2, wherein said control system increases said speed of said cooling element when said temperature of said electronic component increases.

6. The system of claim 2, wherein said control system decreases said speed of said cooling element when said temperature of said electronic component decreases.

7. The system of claim 1, wherein said control system comprises:

a first control function for receiving a tachometer output signal from said cooling element and outputting a control signal for adjusting said speed of said cooling element, said tachometer output signal being a measurement of said speed of said cooling element; and

a second control function for modifying a control signal output from said first control function, said modification based on a reading of said power consumption of said electronic component;

wherein, after said control signal is modified by said second control function, said control signal is input into said cooling element and adjusts said speed of said cooling element.

8. The system of claim 7, wherein said second control function comprises an input for a power signal, said power signal comprising said reading of said power consumption of said electronic component.

9. The system of claim 2, wherein said control system comprises:

a first control function for receiving a tachometer output signal from said cooling element and outputting a control signal for adjusting said speed of said cooling element, said tachometer output signal being a measurement of said speed of said cooling element;

a second control function for modifying said control signal, said modification based on a reading of said power consumption of said electronic component; and

a third control function for modifying said control signal, said modification based on a reading of said temperature of said electronic component;

wherein, after said control signal is modified by said second and said third control functions, said control signal is input into said cooling element and adjusts said speed of said cooling element.

10. The system of claim 9, wherein said second control function comprises an input for a power signal, said power signal comprising said reading of said power consumption of said electronic component.

11. The system of claim 10, wherein, if said reading of said power consumption is higher than a previous reading of said power consumption, said second control function

modifies said control signal in a manner that results in an increase of said speed of said cooling element.

12. The system of claim 10, wherein, if said reading of said power consumption is lower than a previous reading of said power consumption, said second control function modifies said control signal in a manner that results in a decrease of said speed of said cooling element.

13. The system of claim 9, wherein said third control function comprises an input for a temperature signal, said temperature signal comprising said reading of said temperature of said electronic component.

14. The system of claim 13, wherein said third control function:

compares said reading of said temperature of said electronic component to a preset value representing a maximum temperature at which said electronic component may properly operate; and

modifies said control signal in a manner that results in said speed of said cooling element being adjusted to cool said electronic component to a temperature equal to or lower than said maximum temperature.

15. The system of claim 14, wherein said control system is configured to shut down said electronic component if said temperature of said electronic component goes above said maximum temperature.

16. The system of claim 13, wherein said third control function:

compares said reading of said temperature of said electronic component to a preset value representing an ideal temperature at which said electronic component should operate; and

modifies said control signal in a manner that results in said speed of said cooling element being adjusted to cool said electronic component to or below said ideal temperature.

17. The system of claim 13, wherein, if said reading of said temperature of said electronic component is higher than a previous reading of said temperature, said third control function modifies said control signal in a manner that results in an increase of said speed of said cooling element.

18. The system of claim 13, wherein, if said reading of said temperature of said electronic component is lower than a previous reading of said temperature, said third control function modifies said control signal in a manner that results in a decrease of said speed of said cooling element.

19. The system of claim 9, wherein said control signal is a pulse width modulation control signal.

20. The system of claim 9, wherein said control signal is a linear voltage control signal.

21. The system of claim 9, wherein said first control function multiplies said tachometer output signal by an amplifying constant.

22. The system of claim 9, wherein said first control function:

compares said tachometer output signal to a value representing an ideal speed for said cooling element; and

generates said control signal based on said comparison.

23. The system of claim 1, wherein said cooling element is a fan.

24. The system of claim 1, wherein said cooling element is a blower.

25. The system of claim 1, wherein said cooling element is a turbo fan.

26. The system of claim 1, wherein said cooling element is a controllable heat sink or heat spreader.

27. The system of claim 2, wherein said localized system is implemented in a system level cooling solution, said system level cooling solution comprising:

a system cooling element; and

a system thermal management controller for controlling said system cooling element.

28. The system of claim 27, wherein said control system outputs an alert signal to said system thermal management controller, said alert signal signaling to said system thermal management controller to manage said system cooling element.

29. The system of claim 27, wherein said alert signal is a two stage alert signal, said two stage alert signal comprising:

a first stage alert signal requesting said system thermal management controller to increase a speed of said system cooling element; and

a second stage alert signal requesting said system thermal management controller to shut down said electronic component.

30. The system of claim 2, wherein said system is used in combination with one or more other localized systems for dissipating heat generated by electronic components in addition to said electronic component in an electronic device.

31. The system of claim 30, wherein each of said localized systems is implemented in a system level cooling solution, said system level cooling solution comprising:

a system cooling element; and

a system thermal management controller for controlling said system cooling element.

32. The system of claim 7, wherein a microcontroller comprises said control system.

33. The system of claim 9, wherein a microcontroller comprises said control system.

34. The system of claim 33, wherein said microcontroller further comprises analog inputs for a temperature signal and a power signal, said temperature signal comprising said reading of said temperature of said electronic component, said power signal comprising said reading of said power consumption of said electronic component.

35. The system of claim 2, wherein said control system is implemented using analog components.

36. The system of claim 2, wherein said control system is configured with rules for recognizing trends in said variations in temperature and adjusting said speed of said cooling element according to said rules.

37. The system of claim 1, wherein said control system is configured with rules for recognizing trends in said power consumption and adjusting said speed of said cooling element according to said rules.

38. The system of claim 37, wherein one of said rules enables said control system to recognize a spike in power consumption and ignore said spike if said spike does not last more than a specified amount of time.

39. The system of claim 37, wherein one of said rules enables said control system to selectively ignore said variations in power consumption.

40. A method of dissipating heat generated by an electronic component, said method comprising adjusting a speed of operation of a cooling element with a control system in response to variations in power consumption of said electronic component.

41. The method of claim 40, further comprising adjusting said speed of said cooling element in response to variations in temperature of said electronic component.

42. The method of claim 40, further comprising increasing said speed of said cooling element when said power consumption of said electronic component increases.

43. The method of claim 40, further comprising decreasing said speed of said cooling element when said power consumption of said electronic component decreases.

44. The method of claim 41, further comprising increasing said speed of said cooling element when said temperature of said electronic component increases.

45. The method of claim 41, further comprising decreasing said speed of said cooling element when said temperature of said electronic component decreases.

46. The method of claim 40, further comprising:

generating a control signal for adjusting said speed of said cooling element with a first control function, said control signal derived from a tachometer output signal from said cooling element;

modifying said control signal with a second control function, said modification based on a reading of said power consumption of said electronic component; and

controlling said cooling element with said control signal that has been modified.

47. The method of claim 41, further comprising:

generating a control signal for adjusting said speed of said cooling element with a first control function, said control signal derived from a tachometer output signal from said cooling element;

modifying said control signal with a second control function, said modification based on a reading of said power consumption of said electronic component;

modifying said control signal with a third control function, said modification based on a reading of said temperature of said electronic component; and

controlling said cooling element with said control signal that has been modified.

48. The method of claim 46, further comprising modifying said control signal in a manner that results in an increase of said speed of said cooling element if said reading of said power consumption is higher than a previous reading of said power consumption.

49. The method of claim 46, further comprising modifying said control signal in a manner that results in a decrease of said speed of said cooling element if said reading of said power consumption is lower than a previous reading of said power consumption.

50. The method of claim 47, further comprising:

comparing with said third control function said reading of said temperature of said electronic component to a preset value representing a maximum temperature at which said electronic component may properly operate; and

modifying said control signal in a manner that results in said speed of said cooling element being adjusted to cool said electronic component to a temperature equal to or lower than said maximum temperature.

51. The method of claim 50, further comprising shutting down said electronic component if said temperature of said electronic component goes above said maximum temperature.

52. The method of claim 47, further comprising:

comparing said reading of said temperature of said electronic component to a preset value representing an ideal temperature at which said electronic component should operate; and

modifying said control signal in a manner that results in said speed of said cooling element being adjusted to cool said electronic component to or below said ideal temperature.

53. The method of claim 47, further comprising modifying said control signal in a manner that results in an increase of said speed of said cooling element if said reading of said temperature of said electronic component is higher than a previous reading of said temperature.

54. The method of claim 47, further comprising modifying said control signal in a manner that results in a decrease of said speed of said cooling element if said reading of said temperature of said electronic component is lower than a previous reading of said temperature.

55. The method of claim 47, further comprising multiplying said tachometer output signal by an amplifying constant with said first control function.

56. The method of claim 47, further comprising:

comparing said tachometer output signal to a value representing an ideal speed for said cooling element with said first control function; and

generating said control signal based on said comparison.

57. The method of claim 41, further comprising implementing said control system in a system cooling solution.

58. The method of claim 57, further comprising outputting an alert signal from said control system to said system cooling solution, said system cooling solution comprising a system cooling element.

59. The method of claim 58, further comprising sending said alert signal in two stages, said two stages comprising:

a first stage alert signal requesting said system cooling solution to increase a speed of said system cooling element; and

a second stage alert signal requesting said system cooling solution to shut down said electronic component.

60. The method of claim 41, further comprising using said control system in combination with one or more other control systems for dissipating heat generated by electronic components in addition to said electronic component in an electronic device.

61. The method of claim 60, further comprising implementing each of said control systems in a system level cooling solution, said system level cooling solution comprising a system cooling element.

62. The method of claim 41, further comprising recognizing trends in said variations in temperature and adjusting said speed of said cooling element according to rules programmed into said control system.

63. The method of claim 40, further comprising recognizing trends in said power consumption and adjusting said speed of said cooling element according to rules programmed into said control system.

64. The method of claim 63, further comprising recognizing a spike in power consumption and ignoring said spike if said spike does not last more than a specified amount of time.

65. The method of claim 63, further comprising selectively ignoring said variations in power consumption.

66. A system for dissipating heat generated by an electronic component, said system comprising means for adjusting a speed of operation of a cooling element in response to variations in power consumption of said electronic component.

67. The system of claim 66, further comprising means for adjusting said speed of said cooling element in response to variations in temperature of said electronic component.

68. The system of claim 66, further comprising means for increasing said speed of said cooling element when said power consumption of said electronic component increases.

69. The system of claim 66, further comprising means for decreasing said speed of said cooling element when said power consumption of said electronic component decreases.

70. The system of claim 67, further comprising means for increasing said speed of said cooling element when said temperature of said electronic component increases.

71. The system of claim 67, further comprising means for decreasing said speed of said cooling element when said temperature of said electronic component decreases.

72. The system of claim 66, further comprising:

means for generating a control signal for adjusting said speed of said cooling element with a first control function, said control signal derived from a tachometer output signal from said cooling element;

means for modifying said control signal with a second control function, said modification based on a reading of said power consumption of said electronic component; and

means for controlling said cooling element with said control signal that has been modified.

73. The system of claim 67, further comprising:

means for generating a control signal for adjusting said speed of said cooling element with a first control function, said control signal derived from a tachometer output signal from said cooling element;

means for modifying said control signal with a second control function, said modification based on a reading of said power consumption of said electronic component;

means for modifying said control signal with a third control function, said modification based on a reading of said temperature of said electronic component; and

means for controlling said cooling element with said control signal that has been modified.

74. The system of claim 72, further comprising means for modifying said control signal in a manner that results in an increase of said speed of said cooling element if said reading of said power consumption is higher than a previous reading of said power consumption.

75. The system of claim 72, further comprising means for modifying said control signal in a manner that results in a decrease of said speed of said cooling element if said reading of said power consumption is lower than a previous reading of said power consumption.

76. The system of claim 73, further comprising:

means for comparing with said third control function said reading of said temperature of said electronic component to a preset value representing a maximum temperature at which said electronic component may properly operate; and

means for modifying said control signal in a manner that results in said speed of said cooling element being adjusted to cool said electronic component to a temperature equal to or lower than said maximum temperature.

77. The system of claim 76, further comprising means for shutting down said electronic component if said temperature of said electronic component goes above said maximum temperature.

78. The system of claim 73, further comprising:

means for comparing said reading of said temperature of said electronic component to a preset value representing an ideal temperature at which said electronic component should operate; and

means for modifying said control signal in a manner that results in said speed of said cooling element being adjusted to cool said electronic component to or below said ideal temperature.

79. The system of claim 73, further comprising means for modifying said control signal in a manner that results in an increase of said speed of said cooling element if said reading of said temperature of said electronic component is higher than a previous reading of said temperature.

80. The system of claim 73, further comprising means for modifying said control signal in a manner that results in a decrease of said speed of said cooling element if said reading of said temperature of said electronic component is lower than a previous reading of said temperature.

81. The system of claim 73, further comprising means for multiplying said tachometer output signal by an amplifying constant with said first control function.

82. The system of claim 73, further comprising:

means for comparing said tachometer output signal to a value representing an ideal speed for said cooling element with said first control function; and

means for generating said control signal based on said comparison.

83. The system of claim 67, further comprising means for implementing said control system in a system cooling solution.

84. The system of claim 83, further comprising means for outputting an alert signal from said control system to said system cooling solution, said system cooling solution comprising a system cooling element.

85. The system of claim 84, further comprising means for sending said alert signal in two stages, said two stages comprising:

a first stage alert signal requesting said system cooling solution to increase a speed of said system cooling element; and

a second stage alert signal requesting said system cooling solution to shut down said electronic component.

86. The system of claim 67, further comprising means for using said control system in combination with one or more other control systems for dissipating heat generated by electronic components in addition to said electronic component in an electronic device.

87. The system of claim 86, further comprising means for implementing each of said control systems in a system level cooling solution, said system level cooling solution comprising a system cooling element.

88. The system of claim 67, further comprising means for recognizing trends in said variations in temperature and adjusting said speed of said cooling element according to rules programmed into said control system.

89. The system of claim 66, further comprising means for recognizing trends in said power consumption and adjusting said speed of said cooling element according to rules programmed into said control system.

90. The system of claim 89, further comprising means for recognizing a spike in power consumption and ignoring said spike if said spike does not last more than a specified amount of time.

91. The system of claim 89, further comprising means for selectively ignoring said variations in power consumption.

92. The system of claim 89, further comprising means for performing predictive failure analysis

93. The system of claim 37, wherein one of said rules enables said control system to perform predictive failure analysis.

94. The system of claim 93, wherein said control system sends a signal to a system thermal management controller reporting trends that indicate possible failure of said cooling element.

95. The system of claim 93, wherein said control system shuts down said cooling element and enables a backup cooling element if said predictive failure analysis indicates that said cooling element could possibly fail within a set amount of time.

96. The method of claim 63, further comprising performing predictive failure analysis for said cooling element.

97. The method of claim 96, further comprising sending a signal to a system thermal management controller reporting trends that indicate possible failure of said cooling element.

98. The method of claim 96, further comprising shutting down said cooling element and enabling a backup cooling element if said predictive failure analysis indicates that said cooling element could possibly fail within a set amount of time.

99. The system of claim 1, wherein said electronic component is an integrated circuit.

100. The system of claim 1, wherein said electronic component is a central processing unit.

101. The system of claim 1, wherein said electronic component is a chipset, storage unit, processor, or voltage regulator.